

Notice of Allowability

Application No.

09/536,037

Examiner

Toniae M. Thomas

Applicant(s)

LI ET AL.

Art Unit

2822

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to the RCE filed on 09 Oct. 2003.
2. ☒ The allowed claim(s) is/are 52-64.
3. ☒ The drawings filed on 27 March 2000 are accepted by the Examiner.
4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) ☐ All b) ☐ Some* c) ☐ None of the:
 1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____
 3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

* Certified copies not received: _____

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.
 6. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
 - (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached
 - 1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____
 - (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____
- Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).
7. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☒ Notice of References Cited (PTO-892)
2. ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3. ☒ Information Disclosure Statements (PTO-1449 or PTO/SB/08),
Paper No./Mail Date 10/09/03
4. ☐ Examiner's Comment Regarding Requirement for Deposit
of Biological Material
5. ☐ Notice of Informal Patent Application (PTO-152)
6. ☐ Interview Summary (PTO-413),
Paper No./Mail Date _____
7. ☒ Examiner's Amendment/Comment
8. ☒ Examiner's Statement of Reasons for Allowance
9. ☐ Other _____

Mary Wilczewski
Primary Examiner

EXAMINER'S AMENDMENT

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 09 October 2003 has been entered.

Amendment

2. An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

The application has been amended as follows:

The Abstract of the Disclosure has been replaced with the following:

--A low k ~~interlevel~~ inter-level dielectric layer fabrication method includes providing a substrate having integrated circuitry at least partially formed thereon. An oxide-comprising ~~interlevel~~ inter-level dielectric layer ~~comprising~~ including carbon and having a dielectric constant no greater than 3.5 is formed over the substrate. After forming the ~~carbon-comprising~~ dielectric layer, it is exposed to a plasma ~~comprising~~

including oxygen effective to reduce the dielectric constant to below what it was prior to ~~said~~ the exposing. A low k ~~interlevel~~ inter-level dielectric layer fabrication method includes providing a substrate having integrated circuitry at least partially formed thereon. In a chamber, an ~~interlevel~~ inter-level dielectric layer ~~comprising~~ including carbon and having a dielectric constant no greater than 3.5 is plasma-enhanced chemical vapor deposited over the substrate at subatmospheric pressure. After forming the ~~carbon-comprising~~ dielectric layer, it is exposed to a plasma ~~comprising~~ including oxygen at subatmospheric pressure effective to reduce the dielectric constant by at least 10% below what it was prior to ~~said~~ the exposing. The exposing occurs without removing the substrate from the chamber between the depositing and the exposing, and pressure within the chamber is maintained at subatmospheric pressure between the depositing and the exposing.--

Reasons for Allowance

3. The following is an examiner's statement of reasons for allowance: the prior art of record does not anticipate, teach, or suggest a method for forming a low k inter-level dielectric layer substantially as claimed, wherein the method comprises forming a dielectric layer which comprises a compound of silicon bonded to both nitrogen and an organic material, and subsequently exposing the dielectric layer to a plasma comprising nitrogen - the nitrogen-comprising plasma effective to reduce the dielectric constant to below what it was prior to the step of exposing.

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Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

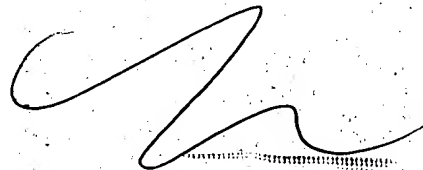
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toniae M. Thomas whose telephone number is (571) 272-1846. The examiner can normally be reached on Monday-Thursday from 8:30 AM to 5:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amir Zarabian can be reached on (571) 272-1852. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

JMJ

16 May 2004



Mary Wilczewski
Primary Examiner